coveries and important inventions. It has witnessed the birth of new elements, the creation of new analytical methods, and an extraordinary development in the instrumental resources of our laboratories. Chemists will never forget that it is to your unwearied assiduity and single-minded devotion that science owes some of the most momentous of these discoveries, and some of the most valuable of these inventions. Your investigations will ever be regarded as models of the highest type of scientific research, and the memoirs in which you have embodied them shed an imperishable lustre on our literature. Your methods of analysis are among the most common of our manipulative operations, and the very furniture and instruments of our laboratories are an ever-present testimony to the obligations under which experimental chemistry will always remain to you.

Many of our members are proud to be numbered among your pupils, and those among them who have become teachers, have, we trust, caught and transmitted something, not only of the method, but also of the spirit, in which they themselves were taught. They have an abiding memory of your kindliness, of your constant and unselfish devotion to their interests, and of the generous sympathy and ready help which you extended to their efforts to enlarge the boundaries of our science.

We, the undersigned Fellows of the Chemical Society of London, now beg to offer you our heartfelt felicitations on the occasion of your Jubilee as a member of our body. It is our fervent hope that you may be able, for many years to come, to enjoy in health and happiness the leisure and repose which you have so justly and so honourably earned.

NOTES.

THE course taken by the Government with regard to a Teaching University for London has met with general approval. The proposed Charter, if it had been accepted, would have done almost irreparable injury to the cause of higher education in the capital. Now we have got rid of it, and the way is clear for new and more carefully considered schemes. The Royal Commission to which the question is to be referred will be free, if it chooses, to examine the question whether, after all, the institution needed by London might not be most readily and most effectually obtained by the development of the existing University. It may be hoped that on this and all other aspects of the question full evidence will be taken. What is wanted is that any recommendations which may be made by the Commission shall be based on extensive and accurate information as to the organization and the proper functions of Universities. On this subject some very crude notions are still current in England.

THE sixth annnal Photographic Conference in connection with the Camera Club will be held in the theatre of the Society of Arts, on Tuesday and Wednesday, March 22 and 23, under the presidency of Captain W. de W. Abney, F.R.S. All photographers are invited to take part in the Conference.

THE Botanical Society of France will hold an extraordinary meeting at Biskra, Algeria, during the first half of April.

A ROYAL COMMISSION has been appointed to consider the question of the water supply of London. Its task will be to inquire whether the present sources of supply are adequate in quantity and quality, and, if inadequate, whether such supply as may be required can be obtained within the watersheds of the Thames and the Lea, or must be obtained elsewhere. Among the members of the Commission are Sir Archibald Geikie and Prof. James Dewar.

A NUMBER of gentlemen, representing institutions interested in science-teaching, recently applied to the Vice-President of the Committee of Council on Education for permission to wait upon him with reference to the changes indicated in the circular issued by the Department of Science and Art, dated November 12, 1891. In answer to a question put by Mr. Schwann, Sir W. Hart Dyke stated in the House of Commons, on Tuesday evening, that he had informed the deputation that he did not think any good purpose would be served by his receiving them. He was, however, willing to reconsider the matter. Sir William expressed his belief that the changes announced in the circular would greatly stimulate more advanced scientific instruction. The minute had been well received in the better schools.

A NEW "Jahrbuch der Chemie" is to be issued by the German publisher, H. Bechhold, Frankfort. It will be edited by Prof. R. Meyer, who has secured the co-operation of many eminent men of science. The intention is that the progress of pure and applied chemistry shall be recorded every year in a connected series of articles.

DR. M. C. COOKE announces that, with the next number of *Grevillea*, his connection with it as editor and proprietor will come to a close, and it will rest with others whether the journal is to be continued. *Grevillea* is "A Quarterly Record of Cryptogamic Botany and its Literature." With the next number it will have completed its twentieth volume.

DR. B. ARTHUR WHITELEGGE will begin at the Royal Institution, on Thursday, March 24, a course of three lectures on epidemic waves. In the first lecture he will deal with cyclic waves; in the second (March 31), with superadded waves; in the third (April 7), with pandemic waves.

THE fifth ordinary meeting of the Egypt Exploration Fund was held last Friday, Sir John Fowler presiding. The balance-sheet was one of the most satisfactory ever presented to the members. The Fund, it was pointed out, was now used in two classes of operations—surveying and excavating; and both "seemed likely to be very successful." In the course of a brief discussion on the report, reference was made to "the generous contributions which had been handed to the Fund from America, in comparison with those received from England."

THE half-yearly general meeting of the Scottish Meteorological Society was held at Edinburgh on Monday, March 7. The following was the business:—(1) Report from the Council of the Society; (2) changes in the temperature of Scotland since 1764, by Dr. Buchan; (3) on the squall of February 1, 1892, by R. C. Mossman; (4) sunshine values at the Ben Nevis Observatory, by R. C. Mossman.

MR. E. J. STONE, F.R.S., and Mr. A. G. Vernon Harcourt, F.R.S., have been elected members of the Athenæum Club, under the rule which provides for "the annual introduction of a certain number of persons of distinguished eminence in science, literature, or the arts, or for public services."

THE fifteenth Convention of the National Electric Light Association, lately held at Buffalo, U.S., seems to have been unusually successful. This is attributed by the American journal *Electricity* to the fact that at previous meetings members attended "not for business but for pleasure." The counter-attractions were so varied and fascinating that it seems to have been difficult "to obtain a creditable attendance on the reading of the papers and the transaction of business." "The plan of doing away with these outside attractions," says *Electricity*, "was therefore an experiment, but so successful did it prove in this instance, that this last Convention will go down in history as 'the business Convention,' unless the increased success of succeeding meetings shall make it necessary to give this one the more specific title of 'the *first* business Convention.'"

THE Natural History Society of Buda-Pesth is stated to number 7800 members. A special botanical meeting of the Society will in future be held monthly, under the presidency of Prof. Juranyi.

THE section of vegetable pathology of the botanical division, in the U.S. Department of Agriculture, was recently made a separate division by Act of Congress. The authorities of the new division decided to begin a fresh series of publications; and they have taken the first step towards the fulfilment of their purpose by the publication of an important *Bulletin*, by Dr. E. F. Smith, presenting "additional evidence on the communicability of peach yellows and peach rosettes."

JAPAN has no fewer than 700 earthquake-observing stations scattered over the Empire, and the Tokio correspondent of the *Times* is of opinion that they are all needed. He points out that not only are the Japanese shaken up by fully 500 earthquakes every year—some of them more or less destructive—but at intervals there comes a great disaster, amounting, as in the earthquake of October 28, 1891, to a national calamity. Japanese annals record twenty-nine such disasters during the last 1200 years.

A SEVERE earthquake shock, lasting twelve seconds, was felt at Napa, California, on March 13, at 8.30 a.m. The direction of the vibration was from north to south.

A CORRESPONDENT at Leon writes to us of an earthquake which was felt in Nicaragua on February 6. He speaks of a connected series of longitudinally oscillating progressive seismic waves, which lasted about ninety-two seconds. They were parallel with, and near, the cones and masses of volcanic ejecta which extend, with some interruptions, between the volcanic groups in the States of Salvador and Costa Rica. The earthquake began at 10.10 p.m.

PROF. HELLMANN, of Berlin, to whom we are indebted for many painstaking investigations into the origin of meteorological instruments and observations, has contributed to the *Zeitschrift für Luftschiffahrt* for January an article on the first balloon voyage made for scientific purposes. The works on the subject of ballooning, of which there are many, state that the first was by Robertson and Lhoëst in 1803, and the next in the following year, by Biot and Gay-Lussac. But this is not correct; the honour undoubtedly belongs to Dr. John Jeffries, of Boston (Mass.), who had for some years lived in this country. In 1786 he published a book (60 quarto pages and 2 plates), entitled, "A Narrative of the Two Aërial Voyages of Dr. Jeffries with Mons. Blanchard; with Meteorological Observations and Remarks." The first voyage was on November 30, 1784, from London to Dartford (Kent), and the second, on January 7, 1785, across the English Channel. A paper containing the results was read before the Royal Society in January 1786. The barometer taken was made by Jones, of Holborn, and read to 18 inches. The heights reached in the two voyages were about 9200 feet and 4500 feet respectively. The latter height was obtained trigonometrically by an officer at Calais, while the balloon lay stationary over the mid-Channel.

THE *Record of Technical and Secondary Education*, published monthly, can scarcely fail to be of service to all who interest themselves in educational progress. The number for March includes, besides editorial notes, accounts of County Council schemes and reports, scholarship schemes, recent progress in various districts, agricultural college for the south-eastern counties, and the financial management of the technical instruction fund. There are also instructive "miscellanea."

A WRITER in the *Mediterranean Naturalist* for March notes that no attention has hitherto been given to the fact that certain species of birds prefer certain trees. He says:—"It is a remarkable fact that, notwithstanding the voluminous literature that has been written on birds and their habits, no writer has noticed the preference that certain species of birds give to certain trees. Jays and rooks are found in the greatest number in oak-trees; finches, in lime-trees; and blackcaps among laurels. The nightingale is always found in the greatest numbers in nut-groves, while the thrush evinces a decided preference for the birch and ash. The beech is the favourite tree of the woodpecker; and the numerous families of tits are generally found in the greatest abundance among the blackthorn."

MR. W. M. GOLDTHWAITE, New York, is publishing a new monthly magazine called *Minerals*. The second number has been sent to us. It contains many short papers, in which interesting facts relating to various classes of minerals are presented in a bright and popular style.

MESSRS. J. AND A. CHURCHILL have issued a fifth edition of Dr. A. Tucker Wise's "Alpine Winter in its Medical Aspects." The work has been condensed and rewritten in many places.

THE U.S. Commissioner of Education has issued his Report for the year 1888-89, and, if it cannot be described as light reading, it is certainly a most instructive and useful work. It consists of two large volumes, and includes a number of chapters in which education in the United States is compared with that of England, France, Germany, and other countries. A full account is also given of normal schools, manual training schools, courses of study, &c. The second volume consists of "detailed statistics of educational systems and institutions, with comments and discussions."

THE peculiar milk-ferment known as "kefyr" or "kephir" has been supposed to be peculiar to the Caucasus and other parts of Eastern Europe and Western Asia. Mr. C. L. Mix has found a yeast apparently identical with it in use in Canada and the United States. It occurs in the form of small granules of a dirty brown colour, which retain their vitality for a long period, and consist of a small proportion of yeast-cells embedded in zoogloea-like masses of rod-shaped bacteria. The yeast-cells increase by budding, and no formation of spores has been detected in them. They do not invert cane-sugar like ordinary beer-yeast, but they cause alcoholic fermentation in milk-sugar or lactose and in dextrine, not in cane-sugar or saccharose. The bacteria are short cylindrical rods with homogeneous protoplasm, developing under cultivation into leptothrix-like filaments in which spores are formed. They appear to take no part in the fermentation, remaining almost entirely embedded in the zooglœa-masses during the process.

HERR W. BELAJEFF has communicated to the *Berichte* of the German Botanical Society a paper on the "Pollen-tube of Gymnosperms," which, if his observations—made on *Taxus* and *Juniperus*—are confirmed with regard to other members of the class, will greatly modify the accepted view as to the morphology of the different parts of the pollen-grain. Hitherto, the two or three small cells in the pollen-grain have been regarded as a survival of the male prothallium of the microspore. Belajeff shows that this cannot be the case, as they are cut off in succession from the large cell. Moreover, he states that it is not, as is usually supposed, the nucleus of the large cell which fertilizes the oosphere in the archegone, but the nucleus of one of the small cells. When the pollen-tube begins to develop, one of these small cells becomes detached and wanders down the tube. Its membrane becomes absorbed; its nucleus overtakes that of the large cell and divides into two; and it is one of these two daughter-nuclei of the wandering small cell, together with the protoplasm which surrounds it, that fuses with the nucleus of the oosphere in the archegone. The other small cell becomes entirely disorganized.

It sometimes happens that peat bogs swell and burst, giving out a stream of dark mud. Herr Klinge has made a study of this rare phenomenon (*Bot. Jahrb.*), of which he has found only nine instances, in Europe, between 1745 and 1883 (seven of these being in Ireland). Heavy rains generally occur before the phenomenon, and detonations and earth vibrations precede and accompany it. The muddy stream which issues, of various fluidity, rolls along lumps of peat, and moves now more quickly, now more slowly. After the outbreak, the mud quickly hardens, and the bog sinks at the place it appeared, forming a funnel-shaped pool. The bogs considered by Herr Klinge have been almost all on high ground, not in valleys. He rejects the idea that the effects are due to excessive absorption of water by the bog. The peat layers, which often vary much in consistency, have each a certain power of imbibition, and the water absorbed does not exceed this limit. Excessive rain affects chiefly the upper layer not yet turned into peat and the cover of live vegetation, which get saturated like a sponge, after which the water collects in pools, and runs off in streams. The theory of gas explosions is also rejected; and the author considers the real cause to lie in land-slips, collapses, &c., of ground under the bog, permitting water or liquid mud to enter. This breaks up the bog mechanically, mixes with it and fluidifies it, and an outburst at the surface is the result. The limestone formations in Ireland, with their large caverns and masses of water, are naturally subject to those collapses, which, with the vibrations they induce, are more frequent in wet years. The heavy rains preceding the bog eruptions are thus to be regarded as only an indirect cause of these. Herr Klinge supposes that similar eruptions occurred in past geological periods, *e.g.* the Carboniferous, in some cases where fossil tree-stems are found in upright position.

The geographical position of Mount St. Elias is of considerable popular interest in connection with the boundaries of Alaska. Mr. Israel C. Russell refers to the subject in a report published in the new number of the American *National Geographic Magazine*. In the convention between Great Britain and Russia, wherein the boundaries of Alaska are supposed to be defined, it is stated that the boundary, beginning at the south, after leaving Portland Channel, shall follow the summit of the mountains situated parallel to the coast as far as the 141st meridian, and from there northward the said meridian shall be the boundary to the Arctic Ocean. Whenever the summit of the mountains between Portland Channel and the 141st meridian "shall prove to be at the distance of more than ten marine leagues from the ocean, the limit between the British possessions and the line of coast which is to belong to Russia, above mentioned, shall be formed by a line parallel to the windings of the coast, and which shall never exceed the distance of ten marine leagues therefrom." As Mount St. Elias is approximately in longitude 140° 55′ 30″ west from Greenwich, it is therefore only 4′ 30″ of longitude, or 2½ statute miles, east of the boundary of the main portion of Alaska. Its distance from the nearest point on the coast is 33 statute miles. There is no coast range in South-Eastern Alaska parallel with the coast within the limits specified by the treaty, and the boundary must therefore be considered as a line parallel with the coast, and ten marine leagues, or 34½ statute miles, inland. The mountain is thus 1½ miles south of the boundary, and within the territory of the United States. Its position is so near the junction of the boundary separating South-Eastern Alaska from the North-West Territory with the 141st meridian, that it is practically a corner monument of the American national domain.

A new and very simple mode of synthesizing tartaric acid has been discovered by M. Genvresse, and is described by him in the current number of the *Comptes rendus*. It will doubtless be remembered that, some years ago, Dr. Perkin and Mr. Duppa prepared tartaric acid artificially by treating di-brom-succinic acid with hydrated oxide of silver, and this operation became the final stage of a complete synthesis from the elementary constituents, when, a short time afterwards, Prof. Maxwell Simpson succeeded in preparing succinic acid by the action of caustic potash upon the di-cyanide of ethylene. M. Genvresse now shows that tartaric acid may be directly synthesized by the action of nascent hydrogen upon glyoxylic acid, CHO—COOH, the curious compound, half aldehyde, half acid, derived from glycol, and hence directly from ethylene. If we double the formula of this acid, and add two atoms of hydrogen, we arrive at tartaric acid, COOH—CHOH—CHOH—COOH, and this is found to be capable of realization by reacting upon glyoxylic acid with nascent hydrogen liberated in its midst by the action of acetic acid upon zinc dust. A mixture of glyoxylic and acetic acids, the latter diluted with an equal weight of water, in the proportion of one molecule of glyoxylic to three molecules of acetic acid, was treated in small quantities at a time with zinc dust, at first at the ordinary temperature, and finally over the water-bath. The liquid was then filtered, and the zinc in solution removed by means of potassium carbonate. The clear liquid was then mixed with calcium chloride solution, and after removal of any calcium carbonate precipitate, a white crystalline precipitate commenced to separate. This precipitate was found to yield all the reactions of a tartrate, such as silvering glass when gently warmed with ammonia and silver nitrate. Its analysis gave numbers indicating the formula $C_4H_4CaO_6 + 4H_2O$, which is the composition of ordinary tartrate of lime. By treating this salt with the calculated quantity of sulphuric acid diluted with twenty times its volume of water, filtering off the precipitated calcium sulphate and evaporating the filtrate over oil of vitriol, the acid itself was obtained in large crystals. It is interesting to find that the tartaric acid obtained by this mode of synthesis is the optically inactive variety known as racemic acid, there being apparently equal numbers of molecules of both the dextro and lævo varieties produced. The crystals consequently do not show hemihedral faces; the angles observed corresponded with those observed by Provostaye and by Rammelsberg in the case of racemic acid. It may be remarked that, as the product of the synthesis of Dr. Perkin and Mr. Duppa, a mixture of racemic acid with the truly inactive tartaric acid, in which neutralization within the molecules themselves occurs, was obtained. This new synthesis of tartaric acid from glyoxylic acid would appear to throw some light upon the natural formation of tartaric acid. For, remembering the close relationship between glyoxylic and oxalic acids, which latter we know to be one most readily formed in vegetable tissues, and the reducing agencies which appear to be connected with chlorophyll, we have all the means at hand to account, in view of the work of M. Genvresse, for the natural synthesis of tartaric acid.

The additions to the Zoological Society's Gardens during the past week include a Common Squirrel (*Sciurus vulgaris*), British, presented by Mrs. Crick; a Merlin (*Falco æsalon*), European, presented by Mr. T. A. Cotton; a Blue Titmouse (*Parus cæruleus*), British, presented by Captain Salvin; two Blossom-headed Parrakeets (*Palæornis cyanocephalus*) from India, presented by La Comtesse Cottrell; a Green Monkey (*Cercopithecus callitrichus* ♂) from West Africa, deposited; a —— Hawk (*Asturina* sp. inc.) from South America, purchased; four Yellow-bellied Liothrix (*Liothrix luteus*) from India, received in exchange; sixteen Puff Adders (*Vipera arietans*), born in the Gardens.